BIOLOGICAL EVALUATION
McFarland Canyon and Camp Bonanza Boy Scout Camp, Toiyabe N.F. and Virgin Peak, BLM Land, East of Mesquite

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INTRODUCTION

An evaluation of the Douglas-fir tussock moth infestation in southern Nevada was conducted by Douglas Parker and Galen Trostle during the week of October 29 through November 2, 1973. The infestation is known to have existed for over three years and has caused some tree mortality in small areas of pure white fir stands.

GENERAL INFORMATION

INSECT: Douglas-fir tussock moth, Orgyia pseudotsugata McD.

HOST TREE: White fir, Abies concolor (Gord. & Glend) Lindl.

LOCATION: McFarland Canyon and Camp Bonanza Boy Scout Camp area north of Charleston Peak, Toiyabe National Forest, and the Virgin Peak area on BLM land east of Mesquite.

EXTENT OF INFESTATION: The total area affected is approximately 775 acres, however, the area covered by trees seriously stressed by defoliation is approximately 140 acres.

BIOLOGICAL INFORMATION

In October 1968, a single white fir tree about 10 feet high was found in Kyle Canyon which had been moderately defoliated by tussock moth larvae. A search of the area at that time revealed no other evidence of infestation in the area. In May of 1971, an infestation of tussock moth was found in the Camp Bonanza Boy Scout area. By 1972 the population had reached epidemic proportions in the camp area and most all the current

foliage was eaten from the white fir where that species was the predominant type. By the fall of 1972, pupal cases of this defoliator could be found throughout the white fir type on the Charleston Mountain.

In that same year an outbreak was also found in a small 60-acre stand of white fir and Douglas-fir on the Virgin Peak area east of Mesquite. This stand constitutes the only stand of trees on the Mesquite unit of the BLM lands and was, therefore, of some concern to the land managers.

In late October of 1973, an overflight was made of the Charleston Mountain infestation. The observable defoliation was mapped on aerial photographs (1:16,840) and 35 mm photographs were taken to document areas of defoliation and tree mortality.

Following the aerial survey, a ground examination was made to determine the average number of current egg masses on one thousand square inches of foliage to provide an indication of the present population level, and the ratio between current and old masses to indicate the trend of the population. Two full branches were cut from the mid-crown of 10 trees scattered about one chain (66 feet) apart around each sample point. Each sample point was in a different area proceeding north from the southern edge of the infestation. A total of eight sample points were taken; the first three were south of the Boy Scout Camp, numbers 4 and 5 were mostly within the camp area, and the remaining three were taken in a line extending north to the edge of major defoliation. Some infestation extended north of the last sample point, but the host type was scattered and would not contribute significantly towards any population increase. The amount of defoliation was recorded by indicating the amount of crown that was completely defoliated.

RESULTS

The amount of defoliation appeared to be well correlated with the percentage of white fir trees in the area. Some defoliation was evident on most all true fir within the infested area, but it was only where white fir existed in almost pure stands that defoliation became serious. Within the area of heavy defoliation, there were a number of trees which appeared to be dead, however, the cause and time of death was difficult to determine. A high percentage of the trees were heavily infected with dwarf mistletoe, some to such a degree that it alone could have caused tree mortality. In other cases, it was apparent that (over the past several years) some trees had been dying, probably due to Scolytus infestation. Where a single tree is defoliated and has massive mistletoe brooms and Scolytus galleries, it is impossible to attribute the cause of death to any one factor. Rather these factors are indicative of the true cause which is the decadent stand condition.

East view of same area as in west view photo. X indicates the same location on each photograph.

West view of defoliated fir showing narrow band of type and scattered nature of the stand.

When sample trees were rated by defoliation classes, it was found that in most cases the defoliation was not typical of tussock moth feeding (Wickman, Trostle, Buffam, USDA Forest Pest Leaflet #86). Rather than the typical complete defoliation of a portion of the crown so that the amount of bare crown is indicative of the defoliation class, these trees, even though almost completely defoliated, still had green needles in the top, and defoliation appeared to be rather even throughout the crown.

Almost every sample taken showed evidence of less defoliation in 1973 than in 1972. Trees which had not recovered showed evidence that 1972 was the year of complete defoliation.

Sample Points	1	2	3	4	5	6	7	8	Ave.
Masses Per M^2 inches foliage	1.3	1.2	0.4	2.4	1.6	3.2	2.8	2.3	1.9 ± .95
Ratio 1973:1972	.21:1	.16:1	.10:1	.37:1	.29:1	.53:1	.37:1	.48:1	.31:1 ± .15

The infestation on Virgin Peak was found to have completely disappeared. The only evidence of an infestation was a few dead trees, a number of trees with only the current 1973 needles present and one or two pupal cases. No egg masses, either old or new, were located.

Similarly, pockets of 1972 infestation in Kyle Canyon had completely disappeared in 1973.

DISCUSSION

The data indicate that the infestation around the Boy Scout Camp will continue next spring, but at a lower level than in 1973. With additional defoliation, more tree mortality can be expected. However, even if the tussock moth caused no additional defoliation, tree mortality would still continue due to the infection of mistletoe and attacks by Scolytus bark beetles.

The unusual appearance of defoliation is assumed to be due to the fact that trees are recovering from the 1972 defoliation--hence 1973 needle growth occurred throughout the crown. Trees had a similar appearance as those on Virgin Peak which were not defoliated in 1973.

True fir on Virgin Peak area illustrating recovery from 1972 tussock moth defoliation.

CONCLUSIONS

This evaluation points up several important facts: 1. Surrounding infestations of tussock moth have disappeared. 2. The count of egg masses indicate that a substantial population will hatch in 1974, however, it is anticipated that the population will continue to decline. 3. The number of current egg masses when compared to the number of old egg masses indicates the 1974 population will be less than in 1973. 4. Current tree foliage growth indicates that the 1973 population was less than the 1972. 5. The most serious defoliation occurred in 1972 and trees are now recovering. 6. The seriously defoliated trees are within the 140 acres of white fir type. 7. The remaining feeding occurred on white fir on 635 acres of mixed type. 8. White fir mortality is being caused by bark beetles, dwarf mistletoe and tussock moth defoliation. 9. Mortality will continue after the tussock moth population disappears. 10. Anticipated mortality will have little or no effect on any currently used resource.

RECOMMENDATION

Do not conduct direct control activities against the Douglas-fir tussock moth.

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